

DOCKET NO. IB-1330-1

IN THE CLAIMS:

Please cancel claim 1.

Please add the following new claims:

52. A luminescent semiconductor nanocrystal compound, comprising:

a) a water-soluble semiconductor nanocrystal comprising:

i) a core comprising a first semiconductor material; and

ii) a core-overcoating shell comprising a second semiconductor material; and

b) a linking agent linked to said water-soluble semiconductor nanocrystal and capable of linking to an affinity molecule.

53. The compound of claim 52, wherein said first semiconductor material is a II-VI semiconductor or a III-V semiconductor.

54. The compound of claim 53, wherein said first semiconductor material is a II-VI semiconductor.

55. The compound of claim 53, wherein said first semiconductor material is a III-V semiconductor.

B1
Cont'd.

⁵
56. The compound of claim ³~~54~~, wherein said first semiconductor material is MgS, MgSe, MgTe, CaS, CaSe, CaTe, SrS, SrSe, SrTe, BaS, BaSe, BaTe, ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, or HgTe.

⁶
57. The compound of claim ⁴~~55~~, wherein said first semiconductor material is GaAs, InGaAs, InP, or InAs.

⁷
58. The compound of claim ¹~~52~~, wherein said second semiconductor material is a II-VI semiconductor or a III-V semiconductor.

⁸
59. The compound of claim ⁷~~58~~, wherein said second semiconductor material is a II-VI semiconductor.

⁹
60. The compound of claim ⁷~~58~~, wherein said second semiconductor material is a III-V semiconductor.

¹⁰
61. The compound of claim ⁸~~59~~, wherein said second semiconductor material is MgS, MgSe, MgTe, CaS, CaSe, CaTe, SrS, SrSe, SrTe, BaS, BaSe, BaTe, ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, or HgTe.

11 9
62. The compound of claim ~~60~~⁹, wherein said second semiconductor material is GaAs, InGaAs, InP, or InAs.

12 1
63. The compound of claim ~~52~~¹, wherein said first semiconductor material is CdSe and the second semiconductor material is ZnS.

13 1
64. The compound of claim ~~52~~¹, wherein said linking agent comprises a thiol moiety.

14 13
65. The compound of claim ~~64~~¹³, wherein said linking agent further comprises an alkyl group.

15 14
66. The compound of claim ~~65~~¹⁴, wherein said alkyl group is a propyl group.

16 1
67. The compound of claim ~~52~~¹, wherein said linking agent is N-(3-aminopropyl)-3-mercapto-benzamide, 3-aminopropyl-trimethoxysilane, 3-mercaptopropyl-trimethoxysilane, 3-maleimidopropyl-trimethoxysilane, or 3-hydrazidopropyl-trimethoxysilane.

17 1
68. The compound of claim ~~52~~¹, wherein said nanocrystal compound further comprises a glass coating on said shell.

18 17
69. The compound of claim ~~68~~¹⁷, wherein said glass coating comprises a polymeric oxide.

B1
Contd.

¹⁹
70. The compound of claim ¹⁸69, wherein said polymeric oxide is an oxide of silicon, an oxide of boron, an oxide of phosphorus, or a mixture thereof.

²⁰
71. The compound of claim ¹⁸69, wherein said glass coating further comprises a metal silicate, a metal borate or a metal phosphate.

²¹
72. The compound of claim ⁷58, wherein said linking agent is N-(3-aminopropyl)-3-mercapto-benzamide, 3-aminopropyl-trimethoxysilane, 3-mercaptopropyl-trimethoxysilane, 3-maleimidopropyl-trimethoxysilane, or 3-hydrazidopropyl-trimethoxysilane.

²²
73. The compound of claim ¹52, wherein said shell epitaxially surrounds said core.

74. A luminescent semiconductor nanocrystal probe, comprising:

a) a water-soluble semiconductor nanocrystal comprising:

i) a core comprising a first semiconductor material; and

ii) a core-overcoating shell comprising a second semiconductor material;

b) a linking agent comprising a first portion and a second portion, wherein said first portion is linked to said water-soluble semiconductor nanocrystal; and

c) an affinity molecule linked to said second portion of said linking agent.

B1
Cont'd.

75. The probe of claim 74, wherein said first semiconductor material is a II-VI semiconductor or a III-V semiconductor.

76. The probe of claim 75, wherein said first semiconductor material is a II-VI semiconductor.

77. The probe of claim 75, wherein said first semiconductor material is a III-V semiconductor.

78. The probe of claim 76, wherein said first semiconductor material is MgS, MgSe, MgTe, CaS, CaSe, CaTe, SrS, SrSe, SrTe, BaS, BaSe, BaTe, ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, or HgTe.

79. The probe of claim 77, wherein said first semiconductor material is GaAs, InGaAs, InP, or InAs.

80. The probe of claim 74, wherein said second semiconductor material is a II-VI semiconductor or a III-V semiconductor.

81. The probe of claim 80, wherein said second semiconductor material is a II-VI semiconductor.

DOCKET NO. IB-1330-1

B1
Cont'd

82. The probe of claim 80, wherein said second semiconductor material is a III-V semiconductor.

83. The probe of claim 81, wherein said second semiconductor material is MgS, MgSe, MgTe, CaS, CaSe, CaTe, SrS, SrSe, SrTe, BaS, BaSe, BaTe, ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, or HgTe.

84. The probe of claim 82, wherein said second semiconductor material is GaAs, InGaAs, InP, or InAs.

85. The probe of claim 74, wherein said first semiconductor material is CdSe and said second semiconductor material is ZnS.

86. The probe of claim 74, wherein said linking agent comprises a thiol moiety.

87. The probe of claim 86, wherein said linking agent further comprises an alkyl group.

88. The probe of claim 87, wherein said alkyl group is a propyl group.

DOCKET NO. IB-1330-1

- B' Cont'd.
89. The probe of claim 74, wherein said linking agent is N-(3-aminopropyl)-3-mercapto-benzamide, 3-aminopropyl-trimethoxysilane, 3-mercaptopropyl-trimethoxysilane, 3-maleimidopropyl-trimethoxysilane, and 3-hydrazidopropyl-trimethoxysilane.
90. The probe of claim 74, wherein said nanocrystal compound further comprises a glass coating on said shell.
91. The probe of claim 90, wherein said glass coating comprises a polymeric oxide.
92. The probe of claim 91, wherein said polymeric oxide is an oxide of silicon, an oxide of boron, an oxide of phosphorus, or a mixture thereof.
93. The probe of claim 91, wherein said glass coating further comprises metal silicate, a metal borate or a metal phosphate.
94. The probe of claim 90, wherein said linking agent is selected from the group consisting of N-(3-aminopropyl)-3-mercapto-benzamide, 3-aminopropyl-trimethoxysilane, 3-mercaptopropyl-trimethoxysilane, 3-maleimidopropyl-trimethoxysilane, and 3-hydrazidopropyl-trimethoxysilane.

DOCKET NO. IB-1330-1

B.
Conc'd.

95. The probe of claim 74, wherein said affinity molecule is an antibody, a nucleic acid, a protein, a polysaccharide or a small molecule.

96. The probe of claim 74, wherein said affinity molecule is avidin, streptavidin, biotin or anti-digoxigenin.

97. The probe of claim 74, wherein said affinity molecule is streptavidin.

98. The probe of claim 74, wherein said linking agent is 3-mercaptopropyl-trimethoxysilane and said affinity molecule is avidin, streptavidin, biotin or anti-digoxigenin.

99. The probe of claim 74, wherein said linking agent is 3-mercaptopropyl-trimethoxysilane and said affinity molecule is streptavidin.

100. The probe of claim 74, wherein said shell epitaxially surrounds said core.

REMARKS

Claim 1 has been cancelled by this preliminary amendment, and new claims 52-100 have been added. Claims 2-51 were previously cancelled in the earlier preliminary amendment dated July 8, 1999, which was filed with this continuation application. Claims 52-100 now remain in this continuation application. Support for the new claims follows.

B